



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,402	01/12/2001	George Cybenko	389522	1647

30955 7590 08/18/2004

LATHROP & GAGE LC  
4845 PEARL EAST CIRCLE  
SUITE 300  
BOULDER, CO 80301

EXAMINER

VAUGHAN, MICHAEL R

ART UNIT	PAPER NUMBER
----------	--------------

2131

DATE MAILED: 08/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/759,402

Applicant(s)

CYBENKO, GEORGE

Examiner

Michael R Vaughan

Art Unit

2131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

Claims 1-16 have been examined and are pending.

### ***Information Disclosure Statement***

An initialed and dated copy of Applicant's IDS form 1449, Paper No. 5, is attached to the instant Office action.

### ***Claim Rejections - 35 USC ' 112, second paragraph***

Claims 2-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 recites, "the step of encoding a program comprises converting the program to a unitary matrix multiplication". Examiner finds this statement confusing and unclear. The program should not be encoding into a matrix operation. Rather the Examiner is interpreting the claim to mean that the encoding of a program comprises converting the program by a unitary matrix multiplication. Clarification and/or correction are required. The same language is present in claim 3 as well.

Art Unit: 2131

Claims 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is not antecedent basis or declaration of X\*Xub in claim 1, which claim 9 depends from.

Claims 15-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is a typo in the second line of the third paragraph of claim 15. The line reads "...executing the enco connected to ded program" but should read --executing the encoded program--.

***Claim Rejections - 35 USC ' 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over a publication to Sander and Tschudin, hereinafter Sander, "Protecting Mobile Agents Against Malicious Hosts" in view of a publication to Staffans, "Quadratic Optimal Control Through Coprime and Spectral Factorizations".

As per claims 1 and 15, Sander teaches a secured network for executing encrypted computer programs at a remote host computer without sharing intelligible or otherwise useful program code, computations or data associated with execution, comprising (2.4):  
a control computer for encoding a program as a matrix with  $n$  rows and  $n$  columns (3.3) and for encoding an input data string to the program as a vector of length  $n$  (3.2, "x"), and a host computer (Bob), in network with the control computer (Alice), for loading the encoded program and the encoded data string, the host computer executing the encoded program, using the encoded data string, and communicating results to the control computer for decoding, the host computer having substantially no intelligible or otherwise useful program code, computations or data associated with execution of the program (3.3).

Sander teaches using any invertible matrix in (3.3). Sander is silent in disclosing that the matrix is a unitary matrix but teaches multiplication is used on the matrix and the input string (3.3). Staffans teaches that all unitary matrixes are invertible (page 14). Consequently, it is known to those of ordinary skill in the

Art Unit: 2131

art that all unitary matrixes have a inversion property. In view of this it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the teachings of Staffans within the system of Sander because unitary matrixes are, as a matter of mathematical fact, invertible.

As per claim 2, Sander teaches the step of encoding a program comprises converting the program to a unitary matrix multiplication (3.3).

As per claim 3, the teachings of claim 2 applies such that it anticipates more than one matrix.

As per claim 9, Sander teaches decoding external to the host computer to determine the desired output (3.2 and 3.3).

As per claim 10, Sander teaches the step of decoding comprises decrypting at a control computer connected to the network and the host computer (sections 2 and 3.2).

As per claims 11-13, Sander teaches a network and it would have been obvious to one of ordinary skill in the art to includes the Internet, VPN's and LAN under that teaching of a net. It is even implied that it is a large network that comprises many servers. This teaching would have motivated one of ordinary skill in the art at the time of the invention to include the Sander system within known networks.

Art Unit: 2131

As per claim 14 and 16, Sander teaches embedding one or more constants into the input data string or program, prior to encoding, to detect incorrect execution or data (2.1).

Claims 5-8, if amended to overcome the 35 USC §112 rejection and put into independent forms including all of the limitations from the parent claims would be allowable.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael R Vaughan whose telephone number is 703-305-0354. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 703-305-9648. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2131

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MV

Michael R Vaughan

Examiner

Art Unit 2131

  
AYAZ SHEIKH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100